

Organic Farming in India

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SUMMARY

Organic farming is the strategy used to accomplish the goals of sustainable farming in order to control the various aspects of the environment. Organic farming is a production method that relies on animal manures, organic waste, crop rotation, legumes and aspects of biological pest control preventing the use of pesticides, fertilizers and growth regulators. Because of their nutritious and health benefits, the popularity of organically grown foods is also growing day by day. The reluctance of farmers towards organic farming in India is due to the lack of availability of adequate organic fertilizers, organic supplements etc., lack of local organic market and also the knowledge of certification and guidelines. While India was far behind in adopting organic farming for a variety of reasons, it has now achieved rapid growth in organic farming.

INTRODUCTION

Organic agriculture has developed by the conscious efforts of inspired people to create the best possible association between the earth and men. It aims at sustaining and increasing the productivity by improving soil health and overall improvement of agro-ecosystem. The total area under organic certification in India is 5.71 M ha with a production of 1.35 MMT of certified organic products (APEDA 2015-16). In recent years, organic farming as a cultivation process is gaining increasing popularity (Dangour *et al.*, 2010). Organically grown foods have become one of the best choices for both consumers and farmers. It is definitely true that India had witnessed a tremendous growth in agricultural production in the era of green revolution. Food grain production, which stood at a mere 50 million tons at the time of independence, had increased almost five and half times to 273.38 million tons by the end of 2016–17 (Press Information Bureau, GOI, 2017) from 159.59 million hectares of cultivated area in country (Agriculture Census, 2010–11). In last 50 years we are using heavy amount of fertilizers and pesticides and we already reach on plateau and diminishing low of return start to work (Venkateswarlu *et al.*, 2008), so we need to apply more input (fertilizer and pesticides) to get small raise in production which cause second generation problem and few of such epitome examples are some regions of Punjab (cancer belt of country) and Endosulfan story of cashew plantations area in Kerala (proving finding of Rachel Carson's Silent Spring was published in 1962). Therefore, for sustaining healthy ecosystem, there is need for adoption of an alternative farming system like organic farming. As per the definition of the United States Department of Agriculture (USDA), study team on organic farming "Organic farming is a system which avoids or largely excludes the use of synthetic inputs (such as fertilizers, pesticides, hormones, feed additives etc.) and to the maximum extent feasible rely upon crop rotations, crop residues, animal manures, off-farm organic waste, mineral grade rock additives and biological system of nutrient mobilization and plant protection".

Principles of Organic Farming

The International Federation of Organic Agriculture Movements (IFOAM) has suggested the basic four principles of organic farming, i.e. the principle of health, ecology, fairness, and care. The main principles and practices of organic food production are to inspire and enhance biological cycles in the farming system, keep and enhance deep-rooted soil fertility, reduce all types of pollution, evade the application of pesticides and synthetic fertilizers, conserve genetic diversity in food, consider the vast socio-ecological impact of food production, and produce high-quality food in sufficient quantity (IFOAM, 1998). The principles of organic farming are as follows (Chandrashekar, 2010):

- To work within a closed system and draw upon local resources as much as possible
- To maintain long-term fertility of soils
- To avoid all forms of pollution that may result from agricultural techniques
- To produce food in sufficient quantity with high nutritional quality
- To minimize the use of fossil energy in agricultural practices

- To make it possible for agricultural producers to earn a living through their work and develop their potentialities as human being

All the above principles are based on the four ethical principles (Principle of Health, Principle of Care, Principle of Fairness and Principle of Ecology) IFOAM, 2005.

Need of organic farming in India

Green revolution technologies such as greater use of synthetic chemicals like fertilizers and pesticides, high-yielding varieties of crops, greater utilization of irrigation potentials etc. has increased the production output in most cases. However, continuous use of these high energy inputs leads to decline in production and productivity of various crops as well as deterioration of soil health and environments. Effects of high input intensive farming system increased awareness of environmental impact of this system and led to a move towards alternatives. At present, the biological or organic approach is one of the best alternative to conventional production system (Subbarao *et al.*, 2007). The potential environmental benefits of organic production and its compatible sustainability, it is considered as a viable alternative for sustainable agricultural development (Ramesh *et al.*, 2005). The recent decade has seen a serious concern over the issue of environmental pollution. Consequently, attempts have been made by many institutions, both public as well as private, to promote sustainable growth especially in regards to health and ecology. So, there is need to raise crops organically for sustainability of health and environment. So there is immense need of organic agricultural practices to eradicate the harmful effects of present day agricultural practices.

Nutritional Benefits and Health Safety

According to a study conducted by AFSSA (2003), organically grown foods, especially leafy vegetables and tubers have higher dry matter as compared to conventionally grown foods. Organic plants contain significantly more magnesium, iron, and phosphorous. They also contain more calcium, sodium, and potassium as major elements and manganese, iodine, chromium, molybdenum, selenium, boron, copper, vanadium, and zinc as trace elements (Rembialkowska, 2007). According to a review of Lairon (2010) which was based on the French Agency for food safety (AFSSA) report, organic products contain more dry matter, minerals and antioxidants such as polyphenols and salicylic acid. In a study of Lairon (2010), organic fruits and vegetables contain 27% more vitamin C than conventional fruits and vegetables. These secondary metabolites have substantial regulatory effects at cellular levels and hence found to be protective against certain diseases such as cancers, chronic inflammations and other diseases (Lairon, 2010). Organic farming improves physico-biological properties of soil consisting of more organic matter, biomass, higher enzyme, better soil stability, enhanced water percolation, holding capacities, lesser water, and wind erosion compared to conventionally farming soil (Fließbach & Mader, 2000; Edwards, 2007; Filebach *et al.*, 2007). In addition, organically managed soils are of greater quality and water retention capacity, resulting in higher yield in organic farms even during the drought years (Pimentel *et al.*, 2005). Biofertilizers and pesticides can be produced locally, so yearly inputs invested by the farmers are also low (Lobley *et al.*, 2005). As the labours working in organic farms are less likely to be exposed to agricultural chemicals, their occupational health is improved (Thompson and Kidwell, 1998).

Future Prospects

- The areas for promotion of organic farming should be like North East Region (NER) of India having about 365 lakh ha which has great potential to be an organic center for the country due to its rich natural resources and less use of chemicals (Sema, 2009).
- Certification of organic farms is a complex and costly process which the small and marginal farmers cannot afford. Group certification is a viable option for small farmers for regulatory mechanism for organic production.
- Organic food market in India is at a nascent stage, proper marketing network between different cities can helpful for developing domestic markets. Regular supply and consistency of quality necessary for premium price of the organic products. Further, the branding of organic products and easy paper work while dealing with export authorities can improve the export potential of organic produce.

- Application of bio-agents and biofertilizers will have greater impact on organic agriculture and also on the control of environmental pollution and improvement of soil health. Inoculation by improved *Azotobacter* strains enhanced the productivity significantly. Use of Phosphate solubilizing bacteria (PSB) helps in increased availability of phosphorous.
- For increasing the productivity of organic systems, Integrated Nutrient Management is one of the better options. However, breeder would have to develop varieties, which respond to the integrated use of organic inputs.
- Popularization of such practices is required which saved irrigation water and seed rate without affecting crop production. Emphasis on developing input efficient varieties and agronomic practices which can enhance the benefit over cost in organic farming. Further, there is need to develop efficient farm tools for small farmers.
- Green Manure is highly beneficial for organic production and maintaining soil health as it enhances the nutrient content in soil as well as increases the yield up to 30-35% than conventional farming.

CONCLUSION

The adverse effects of modern agriculture did not appear all of a sudden and the repetitive use of agrochemicals was not predictable at the time of their introduction. Unsystematic use of fungicides, pesticides and herbicides could lead to unpleasant changes in biological balance and through the toxic residues present in food, to an increase in the incidence of diseases. The rapid replacement with one or two high yielding strains of many locally adapted varieties would result in the spread of severe diseases capable of wiping out entire crops. Environmental protection can be sufficiently tackled by the implementation of Good Agricultural Practices (GAPs). There is therefore a need to establish some framework and the GAP certification does suggest a feasible alternative. The sustainable food safety solution lies in a moderate approach, i.e. Good Farming Practices (GAPs). However the ever-increasing demand for organic food must be met by raising organic crops. Organic farming must co-exist with traditional farming methods for specific crops, specific regions particularly where the state is at an advantageous position, but of course, with the government support in certification, crop insurance and development of market infrastructure for organic produce. As the trend spreads quickly and organic farming draws worldwide interest and there is a potential for the export of organic agricultural products and this opportunity must be tapped with appropriate safeguards.

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